

plan B – muon based options



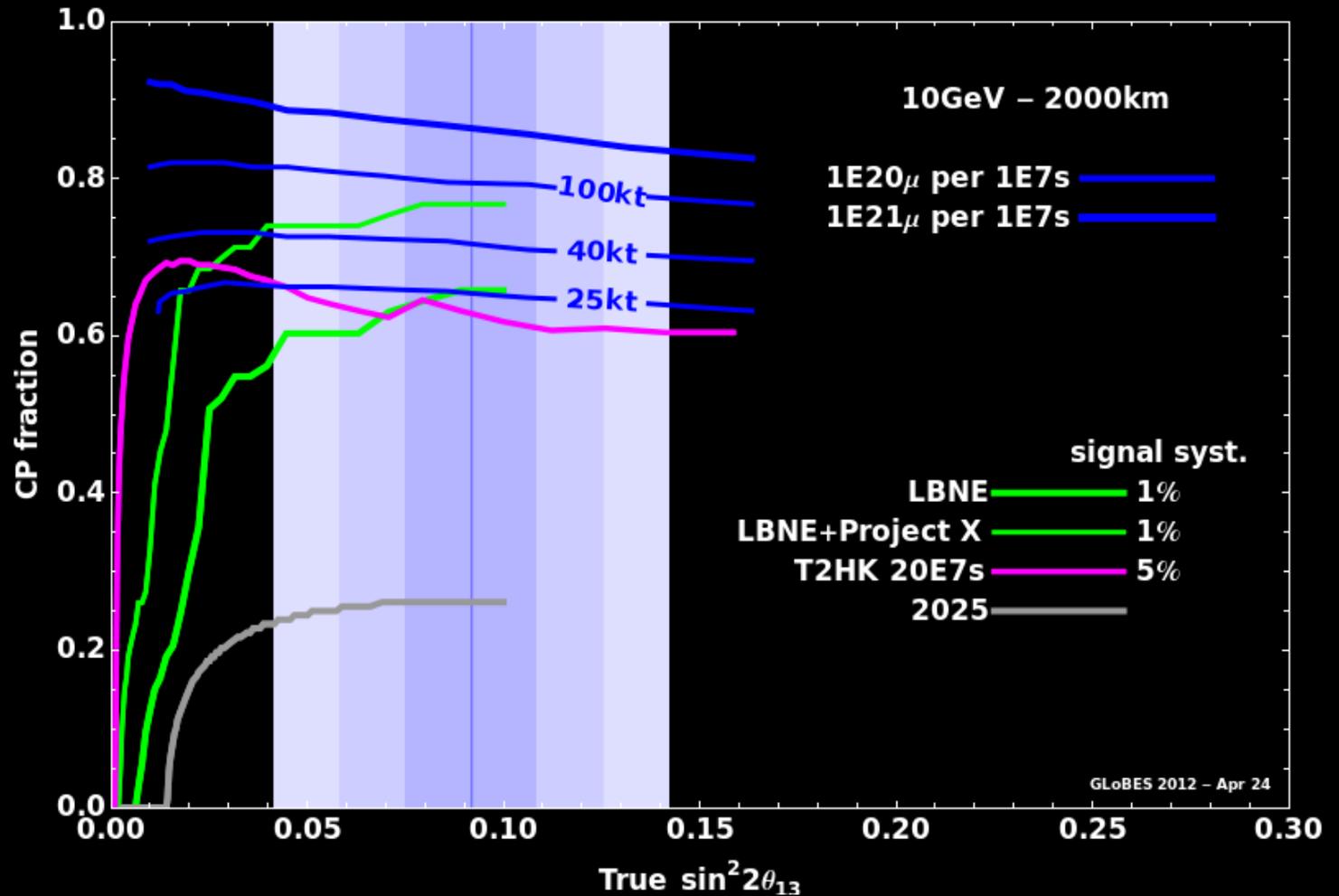
Patrick Huber
Center for Neutrino Physics
Virginia Tech

What if T2HK is real?

Performance of
1.66MW T2HK
similar to full
LBNE

With reduced
systematics
T2HK similar to
LBNE + PX

Why then have
Project X?

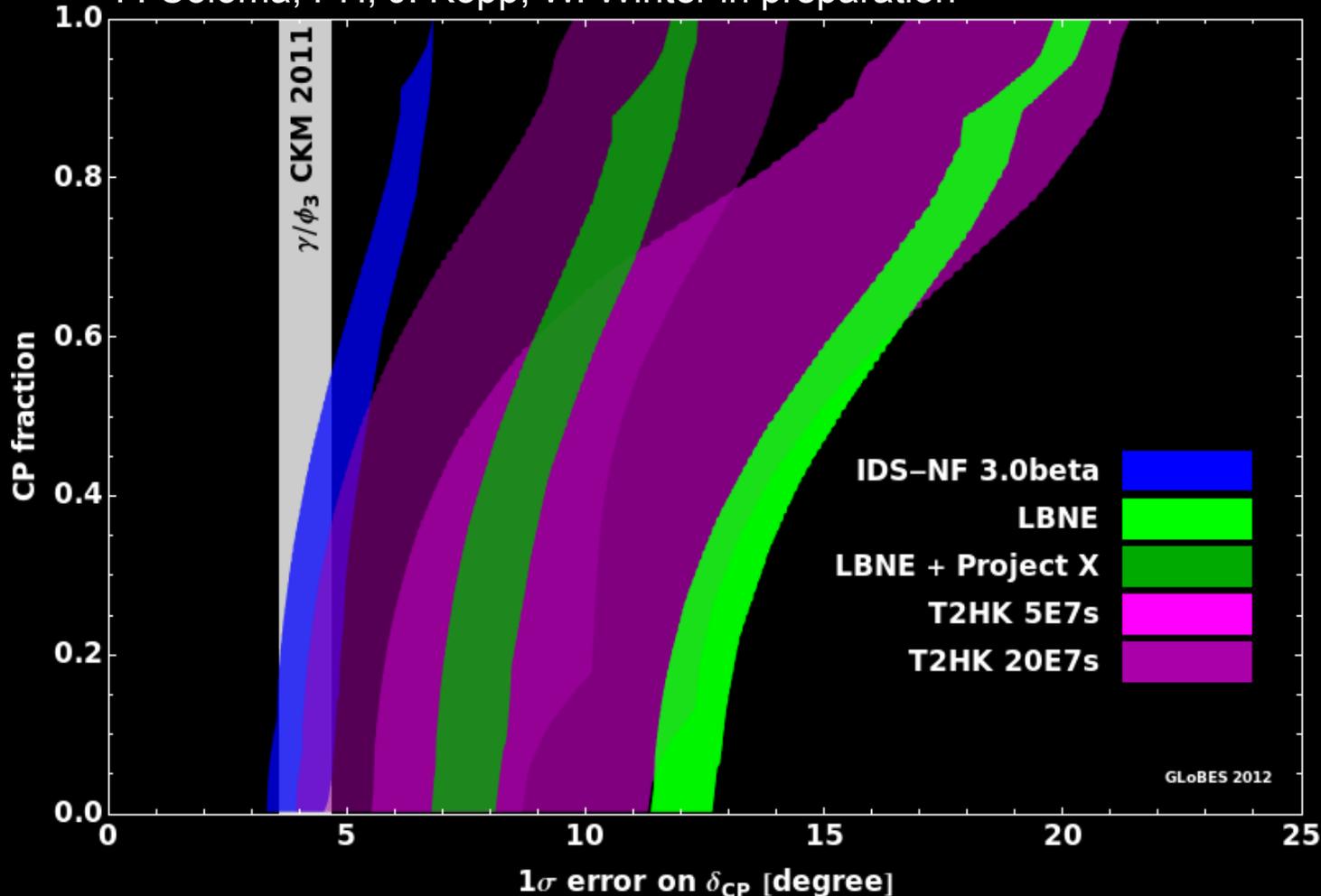


plan B – a muon based neutrino program

- 1E20 muons can be done with 700kW proton power and w/o muon cooling \rightarrow known technology
- 1E21 muons with cooling and Project X
- Stepping stone towards muon collider \rightarrow back to the energy frontier

Precision measurements of the CP phase

P. Coloma, PH, J. Kopp, W. Winter in preparation



Includes near detectors – consistent inputs across all experiments

Width of bands – systematics from optimistic to pessimistic

In precision T2HK outperforms LBNE by some margin

Neutrinos from muon storage ring at low energy can constrain x-sections and resolve the SBL anomalies – VLENF aka vSTORM

plan B – a muon based program

A muon based program has the same science goals as LBNE – the path towards these goals is different.

It provides internationally competitive physics at each stage

- very low energy muon storage ring – x-sections & sterile neutrinos (vSTORM)
- low luminosity neutrino factory – precision CP phase
- full neutrino factory – high precision CP phase & unitarity
- muon collider – return to energy frontier, TeV lepton collisions

The International Design Study for the Neutrino Factory (IDS-NF) and the Muon Accelerator Program (MAP) are existing R&D projects that can support such a path forward.

A muon based approach merits a closer look